

FULL TEXT OF CASES (USPQ2D)

All Other Cases

In re Alton (CA FC) 37 USPQ2d 1578 In re Alton

U.S. Court of Appeals Federal Circuit
37 USPQ2d 1578

Decided February 5, 1996
No. 94-1495

Headnotes**PATENTS****1. Practice and procedure in Patent and Trademark Office -- Prosecution -- Declaration/Affidavits (§ 110.0913)****Patentability/Validity -- Specification -- Written description (§ 115.1103)**

Patent examiner erred by viewing declaration of person skilled in art as opinion evidence addressing question of law rather than question of fact, since declaration attempted to shed light on question of whether specification adequately described subject matter of application claim, since that question is one of fact, and since declaration, rather than asserting opinion on patentability of claimed human gamma interferon analog, offers factual evidence in attempt to explain why one of ordinary skill would have understood specification to describe particular analog claimed.

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2. Practice and procedure in Patent and Trademark Office -- Prosecution -- Declaration/Affidavits (§ 110.0913)**Patentability/Validity -- Specification -- Written description (§ 115.1103)**

Patent examiner erred by dismissing declaration of person skilled in art without adequate explanation of how declaration failed to overcome *prima facie* case for rejection on ground that application did not provide adequate written description of subject matter in claim for human gamma interferon analog, since statement in examiner's answer that specification encompasses substantial number of possible analogs does not refute thrust of declaration, which explains why one of ordinary skill in art would have realized that applicants had possession of one particular analog on their claimed filing date.

Case History and Disposition:

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Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Norman K. Alton, Mary A. Peters, Yitzhak Tabinski, and David L. Snitman, serial no. 06/483,451, filed April 15, 1983, which is continuation-in-part of application filed May 6, 1983, now abandoned. From decision upholding examiner's rejection of application claim 70 for failure to comply with written description requirement of 35 USC 112, applicants appeal. Vacated and remanded.

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Judge:

Before Michel, circuit judge, Friedman, senior circuit judge, and Schall, circuit judge.

Opinion Text**Opinion By:**

Schall, J.

Appellants Norman K. Alton, et al. ("Alton"), appeal the ruling of the United States Patent and Trademark Office Board of Patent Appeals and Interferences ("Board") in Appeal No. 94-3098. In its decision, the Board held that the specification of application serial number 06/483,451 ("the '451 application") did not provide adequate written descriptive support for the amino acid sequence of human gamma interferon ("IFN- γ ") described in claim 70. We vacate the decision and remand the case to the Board for further proceedings.

BACKGROUND I.

IFN- γ is a protein secreted by cells in the human immune system to stimulate immunological activity. 1 Patrick W. Gray et al., *Expression of Human Immune Interferon cDNA in E. Coli and Monkey Cells*, 295 Nature 503 (1982). IFN- γ is believed useful because it activates macrophages, which are a class of cells in the immune system. Bruce Alberts et al., *Molecular Biology of the Cell* 1048, 1049 (2d ed. 1989). IFN- γ is composed of a sequence of 146 amino acids. 2 The complete sequence is divided into four subunits. IFN- γ polypeptides containing alterations in the naturally-occurring amino acid sequence are called "analogs."

Claim 70 of the '451 application, set forth below, recites an analog of IFN- γ :
[Met-¹, des-Cys¹, des-tyr², des-cys³] IFN-1 p polypeptide produced by a DNA sequence coding therefor in a transformant organism, said product having substantially the characteristics of human immune interferon.

(brackets in original). The bracketed words at the beginning of the claim indicate how the claimed IFN- γ differs from the natural version of IFN- γ . 3 "Met," "cys," and "tyr" are abbreviations for three of the twenty amino acids; they stand for methionine, cysteine, and tyrosine, respectively. A positive superscripted number following the abbreviation of an amino acid indicates the position of that amino acid in the 146 amino acid chain that comprises IFN- γ . For example, "tyr²" means that tyrosine is the second amino acid in the 146 amino acid chain. The designation "des" preceding the name of the amino acid indicates that that particular amino acid has been deleted and no amino acid has been substituted in its place. Therefore, "[des-cys¹, des-tyr², des-cys³]" means that the cysteine at position one of the amino acid chain has been removed, as has the

tyrosine at position two and the cysteine at position three. A negative superscripted number indicates that an amino acid has been added onto the beginning (the N-terminus) of the IFN-c sequence. Thus, "met-⁻¹" means that a methionine has been placed at the beginning of the IFN-c amino acid chain.

In sum, the analog of IFN-1 p recited in claim 70 has two characteristics that distinguish it from the natural version of IFN- IFN-c. First, as "[des-cys⁻¹, des-tyr⁻², des-cys⁻³]" indicates, the first three amino acids -- cysteine, tyrosine, and cysteine -- of the natural 146 amino acid sequence have been deleted from the claimed IFN-c analog. These three amino acids are located on the fourth subunit ("IF-4") of the complete sequence. Second, methionine has been placed at the beginning of the amino acid sequence of the claimed analog.

The '451 application's specification contains twelve examples of IFN- c analogs. Of these, Example 5 is closest to the analog that is the subject of claim 70. Like claim 70, it discloses deletion of the first three amino acids and placement of methionine at the beginning of the amino acid sequence of IFN-c ("[met-⁻¹, des-cys⁻¹, des-tyr⁻², des- cys⁻³]"). Unlike claim 70, however, Example 5 additionally discloses substitution of asparagine -- the eighty-first amino acid in the IFN- IFN- c chain -- with lysine, another amino acid ("lys 8⁻¹"). The eighty-first amino acid is located on the second subunit ("IF-2") of the IFN-c sequence.

II.

The '451 application was filed April 15, 1983. It is a continuation-in-part of a parent application filed on May 6, 1982, and later abandoned. The examiner issued a final rejection of the claims of the '451 application as anticipated under 35 U.S.C. Section 102(e) and rendered obvious over the prior art under 35 U.S.C. Section 103.

Alton appealed the examiner's final rejection to the Board. On February 28, 1991, the Board reversed the examiner's section 102 and 103 rejections but rejected the claims on the new ground that the specification failed to describe adequately the subject matter of the claims, as required by 35 U.S.C. Section 112, Para. 1. The Board stated: "The closest analog to that claimed herein is described [in Example 5]. This particular analog, though similar to that claimed herein, does not constitute a description of the claimed analog."

Electing further prosecution pursuant to 37 C.F.R. 1.196(b), 4 Alton submitted to the examiner, in response to the Board's section 112, Para. 1 rejection, a declaration by Dr. Randolph Wall (the "Wall declaration"). In due course, the examiner issued a final rejection on the same grounds as had the Board. Alton then requested reconsideration; the examiner denied the request and maintained his rejection ("final rejection").

Alton appealed the final rejection of claim 70 to the Board. The examiner filed his Answer and the Board sustained the section 112, Para. 1 rejection on June 21, 1994. In its decision, the Board held that "the specific polypeptide of claim 70 was not *described* in the original specification of application Serial No. 06/483,451." The Board adopted the examiner's dismissal of the Wall declaration, in which the examiner reasoned that the declaration was opinion evidence rather than factual evidence. The examiner stated, "Little weight is given an opinion affidavit on the ultimate legal question at issue." This appeal followed.

DISCUSSION I.

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The issue of whether a patent specification adequately describes the subject matter claimed is a question of fact. *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563, 19 USPQ2d 1111, 1116 (Fed. Cir. 1991). We review questions of fact arising from Board rejections under a clearly erroneous standard. *In re Caveney*, 761 F.2d 671, 674, 225 USPQ 1, 3 (Fed. Cir. 1985). We review questions of law *de novo*. *Electronic Design & Sales, Inc., v. Electronic Data Systems Corp.*, 954 F.2d 713, 715, 21 USPQ2d 1388, 1390 (Fed. Cir. 1992).

II.

Alton contends that the Board committed clear error in holding that the '451 specification did not describe the subject matter of

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claim 70. Alton additionally argues that the Board erred in failing to give substantial weight to the Wall declaration.

The adequate written description requirement of 35 U.S.C. Section 112, Para. 1, provides that

[t]he specification shall contain a *written description of the invention*, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

(emphasis added).

The adequate written description requirement, which is distinct from the enablement and best mode requirements, 5 serves "to ensure that the inventor had possession, as of the filing date of the application relied on, of the specific subject matter later claimed by him; how the specification accomplishes this is not material." *In re Wertheim*, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976). In order to meet the adequate written description requirement, the applicant does not have to utilize any particular form of disclosure to describe the subject matter claimed, but "the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (citation omitted). Put another way, "the applicant must . . . convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*." *Vas-Cath*, 935 F.2d at 1563-64, 19 USPQ2d at 1117. Finally, we have stated that "[p]recisely how close the original description must come to comply with the description requirement of section 112 must be determined on a case-by-case basis." *Eiselstein v. Frank*, 52 F.3d 1035, 1039, 34 USPQ2d 1467, 1470 (Fed. Cir. 1995) (quoting *Vas-Cath*, 935 F.2d at 1561, 19 USPQ2d at 1116).

As noted above, following the Board's decision of February 28, 1991, Alton elected further prosecution pursuant to 37 C.F.R. Section 1.196(b). In that context, Alton submitted the Wall declaration in response to the Board's section 112, Para. 1 rejection. In paragraph 9J of his declaration, Dr. Wall addressed the issue of whether Example 5 in the specification described what was claimed in claim 70: 6

J. The specific modifications of subunit IF-4 for deleting both cysteines and the

intermediate tyrosine at amino acid positions 1, 2, and 3 are set out at page 50, lines 11 and 12, which describe modification of the IF-4 subunit (which contains a methionyl residue-specifying codon at position -1) to contain the codons,

5'-ATG CAG-3' 3'-TAC GTC-5'

in the amino acid specifying region. ATG is a codon specifying methionine; CAG is a codon specifying glutamine. Expression of a complete, four subunit, DNA sequence with this modification in subunit IF-4 operatively provides a polypeptide of claims 70. . . . It is my opinion that a skilled worker in molecular biology and the cloning and expression of genes, would, in 1983, have understood the proposed modification [des-cys¹, des-tyr², des-cys³] to have been described independently of any suggestion to alter the arginine [sic: asparagine 7] residue at position 81 of mature human immune interferon. While the specific analog including both the changes in the mature human immune interferon was described as being made and tested, that compound was noted to be an "example" of polypeptide analogs wherein cysteines were deleted for the purpose of facilitating isolation of analogs by destroying the possibility of intermolecular disulfide bridge⁸ formation. Modifying the residue at position 81 would have no effect on this property because neither arginine [sic: asparagine] nor lysine can

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participate in disulfide bridge formation. Moreover, changing to [sic] residue at position 81 would involve a modification in subunit IF-2, requiring an entirely separate series of manipulations of the complete DNA sequence to generate this different class of analog.

Among other things, the Wall declaration states that one of ordinary skill in the art in 1983 would have known, first, that a problem involved with isolating analogs was the capacity of the amino acid sequence to form bonds with itself through disulfide bridges, and second, that deletion of cysteines would eliminate this phenomenon. According to Dr. Wall, one of ordinary skill in the art would have understood the discussion in the specification of Example 5 to be offered as an illustration of the deletion of cysteines. Therefore, according to Dr. Wall, one of ordinary skill in the art, knowing that deleting the first three amino acids of the complete sequence would affect disulfide bridge formation but that the existence of lysine at position 81 would not, would have understood the specification to describe the two modifications independently. Also according to Dr. Wall, a second reason one of ordinary skill in the art would have understood the specification to describe the two modifications independently is that the first three amino acids are located on subunit IF-4, whereas the eighty-first amino acid is located on subunit IF-2.

In his final rejection, which was adopted by the Board, the examiner stated that the specification did not convey that Alton had possession of the subject matter of claim 70 as of April 15, 1983 -- the filing date of the '451 application. In support of the rejection, referring to Example 5, the examiner asserted that the only example in the specification that described deletion of the first three amino acids and placement of methionine at the beginning of the amino acid sequence of IFN-1 p additionally described substitution of asparagine -- the eighty-first amino acid in the IFN-1 p chain -- with lysine, another amino acid. Turning to the Wall declaration, the examiner stated:

In order to support patentability of the claims Dr. Wall points to the same text of the

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specification as previously identified by the Board of Patent Appeals and Interferences as being insufficient. Importantly, Dr. Wall arrives at a conclusion which is opposite that determined by the Board. . . . In view of the previous discussion of the Board of Patent Appeals and Interferences and the evidence of record, this argument is not found to be persuasive. . . . The weight given to the 132 Declaration by Dr. Wall, in particular paragraph . . . 9J, depends on whether it presents allegations, opinions or facts. In this case the Declaration does not point to inherent support or evidence to support the conclusory statement in paragraph 9J. Little weight is given an opinion affidavit on the ultimate legal question at issue.

In short, the examiner rejected Dr. Wall's opinion that "a skilled worker in molecular biology and the cloning and expression of genes, would, in 1983, have understood the proposed modification to have been described independently of any suggestion to alter the arginine [sic] residue at position 81 of mature human immune interferon." The examiner maintained this position in his Answer. In his Answer, the examiner stated that the Wall Declaration does not suggest that the written description in the specification supports an interferon-gamma which *must* have the claimed structure. Indeed, the number of possible interferon-gamma analogs encompassed by the written description of the invention is substantial and the specification does not lead to any compound which must have the claimed structure.

As already seen, the Board adopted as its own the examiner's response to Alton's arguments.

We express no opinion on the factual question of whether the specification adequately describes the subject matter of claim 70. ⁹ We do, however, hold that the examiner's final rejection and Answer contained two errors: (1) viewing the Wall declaration as opinion evidence addressing a question of law rather than a question of fact; and (2) the summary dismissal of the declaration, without an adequate explanation of why the declaration failed to rebut the Board's *prima facie* case of inadequate description.

III.

A. *The Examiner Erred by Mistaking a Question of Fact for a Question of Law*

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As seen above, in his final rejection, the examiner stated that the weight given to Dr. Wall's declaration

depends on whether it presents allegations, opinions or facts. In this case the Declaration does not point to inherent support or evidence to support the conclusory statement in paragraph 9J. Little weight is given an opinion affidavit on the ultimate legal question at issue.

In his Answer, the examiner continued that

[i]t is apparently the " *opinion* " (emphasis added) of Dr. Wall that, as of the filing date of this application, one skilled in the art would have interpreted . . . the specification as specific guidance for a class of interferon analogs lacking the cys-tyr-cys residues at the amino terminus. . . . Little weight is given an opinion affidavit on the ultimate legal question at issue regarding written description for the invention now claimed.

[1] It is well settled that the question of whether a specification provides an adequate written description of the subject matter of the claims is an issue of fact. Therefore, the examiner was in error when he stated that the Wall declaration, which attempted to shed light on whether the '451 specification adequately described the subject matter of claim 70, addressed a legal issue.

Additionally, the examiner interpreted the Wall declaration as offering opinion evidence, rather than factual evidence, on the adequate written description issue. The Wall declaration's assertion that " [m]odifying the residue at position 81 would have no effect on [disulfide bridge formation] because neither [asparagine] nor lysine can participate in disulfide bridge formation" is a factual statement, however. So too is the statement that changing the amino acid at position 81 would involve a modification in subunit IF-2, "requiring an entirely separate series of manipulations of the complete [amino acid] sequence to generate this different class of analog." We do not read the declaration as asserting an opinion on the patentability of the claimed IFN-c analog. Rather, the declaration is offering factual evidence in an attempt to explain *why* one of ordinary skill in the art would have understood the specification to describe the modification involving the deletion of the first three amino acids independently of the modification at position 81. Dr. Wall's use of the words "it is my opinion" to preface what someone of ordinary skill in the art would have known does not transform the factual statements contained in the declaration into opinion testimony. 10 Consequently, the examiner's dismissal of the declaration on the grounds that "[l]ittle weight is given an opinion affidavit on the ultimate legal question at issue" was error.

B. The Examiner Erred by Failing to Articulate Adequate Support for the Rejection
The examiner also erred by dismissing the Wall declaration without an adequate explanation of how the declaration failed to overcome the *prima facie* case initially established by the Board -- the rejection on the ground that the application failed to describe the subject matter of claim 70. The examiner (or the Board, if the Board is the first body to raise a particular ground for rejection) "bears the initial burden . . . of presenting a *prima facie* case of unpatentability." *In re Oetiker* , 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Insofar as the written description requirement is concerned, that burden is discharged by "presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims." *Wertheim* , 541 F.2d at 263, 191 USPQ at 97. Thus, the burden placed on the examiner varies, depending upon what the applicant claims. If the applicant claims embodiments of the invention that are completely outside the scope of the specification, then the examiner or Board need only establish this fact to make out a *prima facie* case. *Id.* at 263-64, 191 USPQ at 97. If, on the other hand, the specification contains a description of the claimed invention, albeit not *in ipsis verbis* (in the identical words), then the examiner or Board, in order to meet the burden of proof, must provide reasons why one of ordinary skill in the art would not consider the description sufficient. *Id.* at 264, 191 USPQ at 98. Once the examiner or Board carries the burden of making out a *prima facie* case of unpatentability, "the burden of coming forward with evidence or argument shifts to the applicant." *Oetiker* , 977 F.2d at 1445, 24 USPQ2d at 1444. To overcome a *prima facie* case, an applicant must show that the invention as claimed is adequately described to

one skilled in the art. "After evidence or argument is submitted by the applicant in response, patentability is determined on the totality of the record, by a preponderance of the evidence with due consideration to persuasiveness of argument." *Id.* at 1445, 24 USPQ2d at 1444.

After claim 70 was first rejected on section 112, Para. 1 grounds, Alton submitted evidence to rebut the rejection in the form of the Wall declaration. 11 The Wall declaration contained statements of fact directly addressing the issue of whether the specification adequately described the subject matter recited in claim 70. The purpose of the adequate written description requirement is to ensure that the inventor had possession of the claimed subject matter at the time the application was filed. If a person of ordinary skill in the art would have understood the inventor to have been in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate written description requirement is met. For example, in *Ralston Purina Co. v. Far-Mar Co., Inc.*, 772 F.2d 1570, 1576, 227 USPQ 177, 180 (Fed. Cir. 1985), the trial court admitted expert testimony about known industry standards regarding temperature and pressure in "the art of extrusion of both farinaceous and proteinaceous vegetable materials." The effect of the testimony was to expand the breadth of the actual written description since it was apparent that the inventor possessed such knowledge of industry standards of temperature and pressure at the time the original application was filed. Similarly, the Wall declaration in essence attempts to expand the breadth of the specification by arguing that a person of ordinary skill in the art would have understood the two modifications in Example 5 of the specification to be described independently of each other and thus a description of both modifications would include a description of either separately.

The thrust of the examiner's response to the Wall declaration, in both the final rejection and the Answer, is that the specification must describe the precise analog claimed. This explains why the examiner stated that the Wall declaration was inadequate because it did not "suggest that the written description in the specification supports an interferon-gamma analog which *must* have the claimed structure." This argument, however, does not address the point that paragraph 9J of the Wall declaration attempts to make: that one of ordinary skill in the art would have understood the specification to describe the two modifications ([met - 1, des-cys 1, des-tyr 2, des-cys 3] and lys 8 1) independently and that the description of both modifications together would be relevant as an example of only one of those modifications ([met - 1, des-cys 1, des-tyr 2, des-cys 3]). Thus, according to the Wall declaration, the specification would be understood to describe the relevant modification ([met - 1, des-cys 1, des-tyr 2, des-cys 3]) without the irrelevant one (lys 8 1). Therefore, according to the Wall declaration, one of ordinary skill in the art would understand Alton to be in possession, in 1983, of the claimed subject matter, which contained the [met - 1, des-cys 1, des-tyr 2, des-cys 3] modification but not the modification at position 81.

[2] The Wall declaration addresses why the claimed subject matter, although not identical to the analog described in the specification, was in Alton's possession. The statement in the examiner's answer that the number of possible analogs encompassed by Copyright 2005, The Bureau of National Affairs, Inc. Reproduction or redistribution, in whole or in part, and in any form, without express written permission, is prohibited except as permitted by the BNA Copyright Policy. <http://www.bna.com/corp/index.html#V>

the specification is substantial does not rebut the thrust of the Wall declaration because the Wall declaration explains why one of ordinary skill in the art would have realized that Alton had possession of one particular analog. In sum, in his final rejection and again in his Answer, the examiner dismissed the Wall declaration and provided only conclusory statements as to why the declaration did not show that a person skilled in the art would realize that Alton had possession of the claimed subject matter in 1983.

CONCLUSION

First, by concluding that the Wall declaration addressed an issue of law instead of an issue of fact, and second, by failing to articulate adequate reasons to rebut the Wall declaration, the examiner and Board failed to consider the totality of the record for the purpose of issuing a final rejection and thus erred as a matter of law. We are not in a position, however, to determine whether the specification contained an adequate written description of the claimed IFN- γ sequence. That determination requires, in the first instance, further proceedings in which the Wall declaration is addressed in a manner that is consistent with this opinion. The case is remanded to the Board for such further proceedings. See *In re Beaver*, 893 F.2d 329,

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13 USPQ2d 1409 (Fed. Cir. 1989) (vacating Board's decision for failing to review all the appealed claims in accordance with the relevant regulations).

COSTS

Each side to pay its own costs. *VACATED and REMANDED*.

ATTACHMENT 4

10
 Cys- Tyr- Cys- Glu- Asp- Pro- Tyr- Val- Lys- Glu- Asp- Lys-
 TUT TAC TGC CAG CAA TAT GTC AAA GAA GCA GAA AAC CTT
 20
 Lys- Lys- Tyr- Phe- Asp- Asn- Glu- Bz- Ser- Asp- Val- Ala- Asp- Asn-
 AAG AAA TAT TTT ATT GCA GGT CAT TCA GAT GTC GAA GAT GAT AAA
 30
 Gly- Thr- Lys- Phe- Leu- Glu- 10- Lys- Lys- Asp- Tyr- Lys- Glu- Glu-
 GGA ACT CTT TTA GGC ATT TTG AAG ATT TGG AAA GAA GAT GAG GAG
 40
 Gly- Thr- Lys- Phe- Leu- Glu- 10- Lys- Lys- Asp- Tyr- Lys- Glu- Glu-
 GGA ACT CTT TTA GGC ATT TTG AAG ATT TGG AAA GAA GAT GAG GAG
 50
 Ser- Asp- Arg- Lys- Ile- Met- Glu- Ser- Glu- Ile- Val- Ser- Phe- Tyr-
 AGT GAC AGA AAA ATA ATT CAG AGC CAA ATT GTC TCC TTT 70
 60
 Phe- Lys- Ser- Phe- Ile- Asp- Phe- Lys- Asp- Asp- Glu- Ser- Ile- Glu-
 TTT AAA CTT TTT AAA AAC TTT AAA GAT GAC CAG ACG ATC CAA
 70
 Lys- Ser- Val- Glu- Thr- Ile- Lys- Asp- Asp- Met- Asp- Val- Lys- Phe-
 AAG AGT GTG GAG ACC ATC AAC GAA GAC ATG ATT GTC AAC TTT
 80
 Phe- Asn- Ser- Asn- Ile- Lys- Lys- Arg- Asp- Asp- Phe- Glu- Lys- Leu-
 TTC ATT AGC AAC AAA AGG AAA CGA GAT GAC TTC GAA AAC AGG CTT
 90
 Thr- Asp- Tyr- Ser- Val- Thr- Asp- Lys- Asn- Val- Glu- Arg- Lys- Ala-
 ACT ATT ATT TGT GTA ACT GAC TTT ATT GTC CAA CGC AAA GCA
 100
 Ile- His- Glu- Lys- Ile- Glu- Val- Ile- Asp- Glu- Lys- Ser- Phe- Ala-
 ATA CAT GAA CTC ATC CAA ATU GTC ATT GCA CTC TGT CAA GCA
 110
 Asp- Lys- Thr- Glu- Lys- Arg- Asp- Ser- Glu- Met- Lys- Phe- Glu-
 OCT AAA ACA GGG AGG CDA AAA AGG AGT CAG ATG CTC TTT CAA

Footnotes

Footnote 1. We understand the parties to be in agreement on the facts regarding the technology in this case.

Footnote 2. Amino acids, of which there are twenty, are small organic molecules.

Benjamin Lewin, *Genes V* 11 (1994). Amino acids combine in linear chains to form proteins. *Id.* at 14. A protein is sometimes referred to as a polypeptide.

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Footnote 3. The 146-amino acid sequence of the IFN- γ analog recited in claim 70 is attached to this opinion.

Footnote 4. 37 C.F.R. Section 1.196(b) (1994) states:

When the Board of Patent Appeals and Interferences makes a new rejection of an appealed claim, the appellant may . . . submit . . . a showing of facts . . . and have the matter reconsidered by the examiner in which event the application will be remanded to the examiner. The statement shall be binding upon the examiner unless an amendment or showing of facts not previously of record be made which, in the opinion of the examiner, overcomes the new ground for rejection stated in the decision. Should the examiner again reject the application the applicant may again appeal to the Board of Patent Appeals and Interferences.

Footnote 5. In order to be considered enabling, a patent must give persons of ordinary skill in the relevant art enough information to practice the invention disclosed in the specification without undue experimentation. *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.* , 750 F.2d 1569, 1576, 224 USPQ 409, 413 (Fed. Cir. 1984). The best mode requirement mandates that the inventor disclose the best mode known to him or her at the time the patent application is filed. *Spectra-Physics, Inc. v. Coherent, Inc.* , 827 F.2d 1524, 1535, 3 USPQ2d 1737, 1745 (Fed. Cir.), *cert. denied* , 484 U.S. 954 (1987).

Footnote 6. The parties do not dispute that Dr. Wall has the requisite skill in the art.

Footnote 7. We understand the parties to be in agreement that recitation in the Wall declaration of the amino acid "arginine," instead of "asparagine," was a typographical error.

Footnote 8. Cysteines contain a sulfur atom. The sulfur atom of a cysteine in an amino acid chain can bond to the sulfur atom in a second cysteine at another location in the same amino acid sequence. Benjamin Lewin, *Genes V* 14 (1994). The resulting cysteine-cysteine bond, known as a disulfide bridge, causes the amino acid chain to bend back on itself. *Id.*

Footnote 9. *See Fiers v. Revel* , 984 F.2d 1164, 1171, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993) ("If a conception of a DNA requires a precise definition, such as by structure, formula, chemical name, or physical properties, . . . then a description also requires that degree of specificity.").

Footnote 10. In any event, we are aware of no reason why opinion evidence relating to a fact issue should not be considered by an examiner. *See Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.* , 776 F.2d 281, 294, 227 USPQ 657, 665 (Fed. Cir. 1985), *cert. denied* , 475 U.S. 1017 (1986).

Footnote 11. We are satisfied that the Board met its *prima facie* case of establishing lack of adequate written description in its February 28, 1991 decision by discussing Example 5 of the specification, in which both modifications appeared together.

- End of Case -

